

ABSTRACT

The use of conductive polyaniline fibers for resistive heating applications is described. Unlike metal wires and conductive-polymer coated fibers, under certain conditions, electric voltages or currents used to generate heat in the fibers were found to produce irreversible changes to the polymer backbone that destroy its electrical conductivity but not its structural integrity. The temperature that these changes occur varies with dopant and fiber diameter, and can be tailored to specific applications. Since these changes occur at lower temperatures than the temperature at which dopant molecules within the conductive polymer are lost or decomposed, both of which lower the conductivity of the material, polyaniline fibers can be used for resistive heating applications where the heating element is in the vicinity of the skin of the wearer thereof.